Claim Listing

1–28. (cancelled)

29. (previously presented) A method for controlling the moisture gradient in production of an uncoated paper web of at least SC quality, having a cross direction, a running direction and a thickness direction, comprising the steps of:

pre-moisturizing, with a pre-moisturizer, the paper web in the cross direction substantially across the entire width of the web from an initial moisture content before pre-moisturizing to a selected pre-moisture content;

passing the pre-moisturized paper web through a multi-nip calender having at least a first roll stack and a last roll stack, each roll stack having at least three rolls, and wherein the multi-nip calender is situated before a slitter-winder of the web;

intermediate-moisturizing the web, with an intermediate-moisturizer, in the cross direction substantially across the entire width of the web before the last roll stack and after a first calendering nip of the first roll stack to a selected intermediate moisture content;

drying the web in the last roll stack to a selected final moisture value;

continuously controlling the moisture gradient of the web in the thickness-direction in the multi-nip calender by adjusting the pre-moisturizing of the web, based on a calculated or measured value of the selected final moisture value of the web.

30. (previously presented) The method of claim 29, wherein the pre-moisturizer is controlled by the final moisture value of the web as measured after the last roll stack.

31. (previously presented) The method of claim 29 wherein the intermediate moisturizer is controlled by the final moisture value of the web as measured after the last roll stack.

32. (previously presented) The method of claim 29 wherein the pre-moisturizer or the intermediate moisturizer is controlled automatically.

33. (previously presented) The method of claim 29 wherein a final moisture value is calculated from the selected pre-moisture value of the web and from evaporation of moisture that has occurred in each roll stack; and the intermediate moisturizing of the web is carried out by the intermediate moisturizer of the web.

34. (previously presented) The method of claim 29 wherein evaporations from each roll and the additional or intermediate moisturizing of the web form a subtotal, and that said subtotal and the pre-moisture value of the web are passed as separate variables through a coupling means to serve as a control parameter of the pre-moisturizer.

35. (previously presented) The method of claim 29 wherein the final moisture value which has been either measured, or calculated in a coupling means, is passed by means of the coupling means to serve as a control parameter of the pre-moisturizer.

36–42. (canceled)

43. (withdrawn) The method of claim 57, wherein the final moisture value of the web is measured after the second roll stack.

44. (withdrawn) The method of claim 57 further comprising the step of continuously controlling the moisture profile or moisture gradient of the web in the thickness-direction, in the multi-nip calender by adjusting the intermediate moisturizing of the web, based on the selected final moisture value of the web.

45. (withdrawn) The method of claim 57 wherein a final moisture value is calculated from a moisture value of the web after pre-moisturizing, minus the evaporation of moisture that has occurred in the first roll stack, plus moisture addition by intermediate moisturizing of the web minus the evaporation of moisture that has occurred in the second roll stack.

46. (withdrawn) The method of claim 45 wherein evaporations from each roll and the additional moisture added by intermediate moisturizing of the web form a subtotal, and that said subtotal and the pre-moisture value of the web are passed as separate variables through a coupling means to serve as control parameters for controlling the moisture profile or moisture gradient of the web in the thickness-direction in the multi-nip calender by adjusting the pre-moisturizing of the web.

47. (withdrawn) The method of claim 57 wherein each roll of the multi-nip calender has a center line passing through an axis of said roll.

48. (withdrawn) The method of claim 47 wherein the axes of each roll of the multi-roll calender lie in the same plane

49. (withdrawn) The method of claim 57 wherein the first stack has a number of rolls which is an odd integer whose value is at least 3.

50. (withdrawn) The method of claim 57 wherein the second stack has a number of rolls which is an odd integer whose value is at least 3.

51. (withdrawn) The method of claim 57 wherein the number of the rolls in the first roll stack is odd and in which an elastic backing roll and a hard press roll are placed alternately one after the other.

52. (withdrawn) The method of claim 57 wherein the number of the rolls in the second roll stack is odd and in which an elastic backing roll and a hard press roll are placed alternately one after the other.

53. (withdrawn) The method of claim 57 wherein the paper web is made from a pulp that contains mechanical pulp and chemical pulp, and has a range of roughness of between 0.8 and 2.0 μm, and an average Hunter gloss of the paper web, taken as an average value of an upper and a lower surface of the web, of greater than 45%.

54. (withdrawn) The method of claim 57 wherein the paper web is made from a pulp that contains mechanical pulp and chemical pulp, and has a range of roughness of between 0.8 and 2.0 μm, and an average Hunter gloss of the paper web, taken as an average value of an upper and a lower surface of the web, of greater than 55%.

55. (canceled)

56. (withdrawn) The paper web of claim 58 wherein the average Hunter gloss of the paper web, taken as an average value of an upper and lower surface of the web is greater than 55 %.

57. (withdrawn) The method of claim 29 wherein the process steps are performed with respect to a paper web having a basis weight of 30 to 80 g/m^2, and a filler content of 15% to 40%.

58. (withdrawn) The method of claim 29 wherein the paper web is made from a pulp that contains mechanical pulp and chemical pulp, and after drying the web in the last stack has a range of roughness of between 0.8 and 2.0 μm, and an average Hunter gloss of the paper web, taken as an average value of an upper and a lower surface of the web, of greater than 45%.